

# New Jersey Department of Health Vaccine Preventable Disease Program Pertussis FAQs

**Date: January 10, 2013**

## **KEY MESSAGES:**

1. Pertussis is a very contagious vaccine-preventable disease that can cause serious illness and even death—especially in infants who are too young to be fully vaccinated (<6 months).
2. Maintain high DTaP coverage rates among children and improve coverage with Tdap among adolescents and adults – especially pregnant women - to prevent the spread of disease and to protect the most vulnerable, particularly young infants. The latest data show that fewer than 10 percent of adults have received a Tdap booster shot.
3. Focus efforts most on protecting those at highest risk for severe disease (infants, immunocompromised, and pregnant women in 3<sup>rd</sup> trimester) when antibiotics are given to protect people exposed to pertussis (prophylaxis).
4. CDC and ACIP will continue to evaluate and refine vaccination policy and prevention and control recommendations.
5. The next consideration for ACIP will likely be a recommendation for repeat vaccination with Tdap.

## **DESCRIPTION OF PERTUSSIS**

### **What is pertussis?**

Pertussis, also known as ***whooping cough***, is a bacterial disease caused by a type of bacteria called *Bordetella pertussis*. This bacterium lives in the mouth, nose and throat of an infected person

### **Who gets pertussis?**

Pertussis can occur in people of all ages. Pertussis is most severe in infants less than one year old. More than half of these infants who get the disease are hospitalized. Many infants who get pertussis catch it from their older brothers and sisters, or from their parents or other caregiver who might not even know they have the disease.

## **How do people get pertussis?**

Pertussis is very easily spread from person to person, especially when coughing starts. A person can spread pertussis up to three weeks after symptoms appear. When an infected person talks, coughs or sneezes, the bacteria are released into the air and enter another person's body through the nose, mouth or throat. People can also become sick if they come in contact with the mucus or saliva (spit) from an infected person.

## **What are the symptoms of pertussis?**

- Pertussis usually starts with cold-like symptoms, and maybe mild cough, but not every runny nose or cough is pertussis. With pertussis, severe and prolonged coughing can begin after 1-2 weeks and can become severe.
- Because pertussis in its early stages appears to be nothing more than the common cold, it is often not suspected or diagnosed until the cough persists or becomes severe. Infected people are most contagious in the first 2 weeks after the cough begins. Antibiotics, when given early, may shorten the amount of time someone is contagious.
- In infants, the cough may be minimal or absent. However, infants may have the symptom known as "apnea." Apnea is a prolonged pause (about 20 seconds) in the child's breathing pattern.
- Someone with pertussis can cough violently and rapidly, over and over, until the air is gone from their lungs and they're forced to inhale with a loud "whooping" sound. This extreme coughing can result in vomiting and exhaustion.
- The coughing fits can go on for up to 10 weeks or more.
- Although children are often exhausted after a coughing fit, they usually appear relatively healthy in-between. Coughing fits usually become more frequent and increase in severity as the illness progresses, and can occur more often at night.
- The illness can be milder (less severe) and the typical "whoop" absent in children, adolescents, and adults, especially those who have been vaccinated.
- Recovery from pertussis is gradual. The cough becomes less severe and less frequent. However, coughing fits can return with other respiratory infections for many months after the pertussis infection started.

## **How severe is pertussis?**

- Pertussis can cause serious illness in infants, children and adults.
- In 2010, there were 27,550 cases of pertussis reported in the United States.
  - 4,298 (15.6%) of those cases were in infants younger than 1 year of age.
  - 4,858 (17.6%) of those cases were in adolescents 11 through 18 years of age.

- Pertussis is most severe for infants.
  - In 2010, 25 infants younger than 1 year of age died from pertussis. Through early December, 14 pertussis-related deaths in infants have been reported to CDC for 2012.
  - More than half of infants less than 1 year of age who get the disease are hospitalized.
  - Of hospitalized infants, about 1 in 4 infants with pertussis get pneumonia (lung infection), and about 1 or 2 in 100 will have convulsions.
- Pertussis can be deadly, especially in infants.

## **How do you know if you have pertussis?**

When you or your child develops a prolonged or severe cough, it may be pertussis. The best way to know if you have pertussis is to contact your doctor.

Pertussis is usually diagnosed by:

- Traditional signs and symptoms;
- Physical examination; and
- Evidence of pertussis circulation in the community.
- Laboratory tests, which usually involve taking a sample from the back of the throat through the nose, can confirm the pertussis diagnosis.

## **How is pertussis treated?**

- If you or your child is having trouble breathing, go to a doctor immediately.
- Tell the doctor if you or your child has been around others with cough/cold symptoms or if you've heard that pertussis is in your community.
- Antibiotic treatment may make the pertussis infection less severe if it is started early, before the severe cough begins.
- Antibiotic treatment can also help prevent spreading the disease to close contacts (people who have spent a lot of time around the infected person).
- There are several antibiotics available to treat pertussis. If you or your child is diagnosed with pertussis, your doctor will explain how to treat the infection.
- Even with treatment, the cough can persist for many weeks or months since the damage has already been done to your body.

# **PERTUSSIS VACCINATION**

## **How can you prevent pertussis?**

- The best way to prevent pertussis is to get vaccinated. Pertussis vaccines are available for anyone over 6 weeks of age. Vaccinating everyone in contact with newborns can protect children who are too young to be immunized or who have

not yet completed the vaccine series. Vaccinating expectant mothers can provide some protection to young infants before they are old enough to get immunized.

- Parents can also help protect infants by keeping them away as much as possible from anyone who has a cough. In addition, you should stay away from infants if you have a cough.
- It is also important to wash your hands, cover coughs and sneezes, and stay home when sick. Hand washing is an important prevention method to avoid the spread of many diseases.

### **What do I need to know about the infant/childhood pertussis vaccine (DTaP)?**

- In the United States, the recommended pertussis vaccine for children is called DTaP (diphtheria-tetanus-acellular pertussis).
  - This is a very safe and effective combination vaccine that protects children against three diseases: diphtheria, tetanus, and pertussis.
  - For maximum protection against pertussis, children need 5 DTaP shots. The first three shots are given at 2, 4, and 6 months of age. The fourth shot is given at 15 through 18 months of age, and a fifth shot is given when a child enters school, at 4 through 6 years of age.
- Some brands of vaccine contain DTaP along with other vaccines in a single shot. DTaP vaccine can safely be combined with other vaccines to make these combination vaccines. Combination vaccines may be used for any or all doses.

### **What do I need to know about the adolescent/adult pertussis vaccine (Tdap)?**

- Vaccine protection for infant/childhood pertussis, tetanus, and diphtheria vaccines (DTaP) can decrease with time. Before 2005, the only booster vaccine (an extra dose of vaccine for increased protection) available for adolescents and adults contained tetanus and diphtheria (called Td) but not pertussis. Today there is a booster for adolescents and adults that contains tetanus, diphtheria, and pertussis (called Tdap).

### **Who needs to receive Tdap?**

- Tdap is routinely recommended for everyone 11 years and older, preferably at 11-12 years of age.
- All healthcare providers regardless of age should receive a single dose of Tdap as soon as possible if they have not previously received it.
- Pregnant women should get Tdap during the third trimester. By getting Tdap during pregnancy, maternal pertussis antibodies transfer to the newborn, likely providing protection against pertussis in early life, before the baby starts getting

DTaP vaccines. Tdap will also protect the mother at time of delivery, making her less likely to transmit pertussis to her infant. If not vaccinated during pregnancy, Tdap should be administered immediately postpartum, before leaving the hospital or birthing center.

- Children ages 7 through 10 years who have not completed a full primary series of DTaP should receive a single dose of Tdap to provide protection against pertussis. If additional doses of tetanus and diphtheria toxoid-containing vaccines are needed, then children ages 7 through 10 years should be vaccinated according to the Centers for Disease Control and Prevention (CDC) catch-up schedule.
- Adults 19 years and older who haven't gotten Tdap should get a dose of Tdap instead of their next regular tetanus booster-- that Td shot that they were supposed to get every 10 years. You can get Tdap now and don't have to wait until you are due for your booster. Tdap can be administered regardless of interval since the previous Td dose, so it's a good idea for adults to talk to a healthcare provider about what's best for their specific situation.
- Getting vaccinated with Tdap at least two weeks before coming into close contact with an infant is especially important for families with and caregivers of new infants

### **What is “cocooning”?**

- In many cases, pertussis in infants is acquired from a family member. Getting vaccinated with Tdap is especially important for all family members and caregivers of infants – not just for moms.
- The strategy of protecting infants by vaccinating those around them is known as cocooning.
- Since 2005, as part of the cocooning strategy, the Advisory Committee on Immunization Practices (ACIP) has recommended that Tdap vaccines be given to unvaccinated mothers and family members of newborn infants.
- To enhance the protection of cocooning, ACIP continues to recommend that unvaccinated adolescents and adults who have or anticipate having close contact with an infant younger than 12 months of age should receive a single dose of Tdap vaccine to protect against pertussis. Ideally, these adolescents and adults should receive the vaccine at least two weeks before beginning close contact with the infant.

### **How effective are pertussis vaccines?**

As time goes by since you received your last pertussis vaccine, protection can fade – this is known as waning of immunity. This is why we see fully vaccinated kids and adults sometimes get the disease.

When a fully vaccinated person gets pertussis, it doesn't mean that pertussis vaccines don't work. Most vaccines don't protect everyone who gets them or last for a lifetime. Vaccine effectiveness looks at how well the vaccine protects you from getting a disease. Vaccine effectiveness can be measured at different points in time since you last got the vaccine, which is known as the vaccine's duration of protection. Duration of protection

looks at vaccine effectiveness over time – how well and for how much time a vaccine protects you. CDC continuously evaluates vaccine effectiveness, including duration of protection, to make sure the vaccines used remain effective at preventing disease.

### **DTaP Duration of Protection and Vaccine Effectiveness:**

- In general, DTaP vaccines are 80-90% effective.
- Kids get their 5<sup>th</sup> dose of DTaP at 4 through 6 years of age, typically before school entry. Among kids who get all 5 doses of DTaP on schedule, effectiveness is very high (98%) within the year following the 5<sup>th</sup> dose. There is a modest decrease in effectiveness in each following year. About 70% of kids are protected 5 years after getting their last dose of DTaP. This suggests waning of immunity occurs.
- Children who never got any doses of DTaP vaccine are at least eight times more likely to get pertussis than children who got all five doses of the vaccine before seven years of age.
- Waning immunity from DTaP vaccine reinforces the need for a routinely recommended booster dose of Tdap at age 11 or 12 years.
- During the 1990s, the U.S. switched from using DTP to DTaP due to safety concerns with DTP. The switch to a safer vaccine seems to have come at the cost of less duration of protection – meaning the newer vaccine is not protecting for as long as the earlier vaccine. Even so, DTaP vaccines are very effective at preventing pertussis in the short-term after vaccination.

### **Tdap Duration of Protection and Vaccine Effectiveness:**

- Increased rates of pertussis cases have also been reported in adolescents.
- Tdap is recommended for 11-12 year olds and is estimated to be approximately 70% effective.
- Protection probably fades with time after getting the booster dose.
- CDC is working to understand the duration of protection of Tdap and whether that may differ in people who got acellular pertussis vaccines (DTaP) as infants/children, compared to people who received DTP vaccine as infants/children.
- ACIP is considering whether repeat doses of Tdap will be needed.

### **What are the side effects of pertussis vaccines?**

- Risks of DTaP Vaccine
  - Most side effects are mild and include fever; redness, swelling or soreness at the site of the shot; fussiness; tiredness or poor appetite; or vomiting.
  - Moderate side effects are uncommon. One child out of 1,000 may cry for three or more hours; one out of 14,000 may have a seizure; one out of 16,000 may have high fever.

- Severe side effects are very rare. For example, fewer than one in a million children have a severe allergic reaction.
- Risks of Tdap Vaccine
  - Mild side effects are fever; redness, swelling or soreness at the site of the shot; tiredness; vomiting; chills or body aches.
  - Moderate side effects are uncommon. One adolescent out of 100 and one adult out of 250 will have a fever over 102°F.
  - Severe side effects are very rare. Fewer than one in a million adolescents and adults have a severe allergic reaction.

## **How do people pay for DTaP and Tdap vaccines?**

- Most health insurance plans cover the cost of vaccines, but you may want to check with your insurance provider before going to the doctor. You should also check with your local health department to see if they offer vaccines, possibly at a reduced cost. If you don't have insurance or if it does not cover vaccines for your child, the Vaccines for Children (VFC) program may be able to help.
- The VFC program provides vaccines at no cost to doctors who serve eligible children.
  - Children younger than 19 years of age are eligible for VFC vaccines if they are Medicaid-eligible, American Indian, Alaska Native, or have no health insurance.
  - "Underinsured" children who have health insurance that does not cover vaccination can receive VFC vaccines through Federally Qualified Health Centers.
  - Parents of uninsured or underinsured children who receive vaccines through the VFC program should check with their doctors about possible administration fees that might apply. These fees help doctors cover the costs that result from important services like storing the vaccines and paying staff members to give vaccines to patients. However, VFC vaccines cannot be denied to an eligible child if a family can't afford the fee.
- There are over 1,200 medical providers enrolled in the New Jersey VFC program. For more information, contact the NJDHSS VFC program at (609) 826-4862 or [vfc@doh.state.nj.us](mailto:vfc@doh.state.nj.us)

## **RECENT PERTUSSIS CASES**

### **How common is pertussis in the United States?**

- Pertussis is one of the most commonly occurring vaccine-preventable diseases in the United States, with cases typically being reported annually in every state.

- Even with the success of pertussis vaccines, people continue to get pertussis in the United States.
- Since the 1980s, there's been an increase in the number of cases of pertussis.
- Multiple factors have likely contributed to the increase in pertussis reported since the 1980's, including waning immunity, increased recognition, and improved diagnostic testing and reporting.
- Reported increases in pertussis cases are likely not a result of improper vaccine storage and handling. The CDC is studying the increase in cases in several states, and is considering all possible causes.
- In 2010, the last peak year, there were 27,550 reported cases including 25 infant deaths from pertussis nationally. This is the most number of reported cases in 52 years — since 1959 when there were 40,005 cases. But, many cases of pertussis are not recognized or reported so this is a substantial underestimate.
- In 2011, 18,719 cases of pertussis were reported nationally, including 13 deaths.
- More than 41,000 cases of pertussis were reported to CDC through during 2012 including 18 pertussis-related deaths. The majority of deaths continue to occur among infants younger than 3 months of age.
- Pertussis occurs in a cyclical pattern, with the number of cases peaking every 3 to 5 years as people's immunity wears off and the bacteria begin circulating again. Peak years occur when enough susceptible people build up in the population to allow for sustained transmission of pertussis. This pattern is not completely understood, but that's why it's important that everyone get vaccinated.
- Vaccines are still the safest and most effective tool we have for preventing pertussis—we no longer see 200,000 cases per year as we did in the pre-vaccine era.
- If pertussis is circulating in the community, there is a chance that a fully vaccinated person (of any age) can catch this very contagious disease. No vaccine is 100 percent effective and protection from this vaccine decreases over time.
- Fortunately, the illness is typically milder in those who have been vaccinated, protecting them from severe disease.

## **Are there cases of pertussis in NJ?**

The New Jersey Department of Health observed an increase in pertussis cases beginning July 2011.

- In 2011, 312 confirmed or probable cases were identified compared with 169 cases in 2010.
  - 8% of cases occurred in those < 1 year of age, 5% in 1-4 years, 14% in 5-9 years, 34% in 10-19 years, 4% in 20-29 years, and 35% in >30 years of age.
  - Of all cases < 1 year of age, 76% have been hospitalized.



- To date, 754 confirmed or probable cases have been identified in 2012\*.
  - 10% of cases occurred in those < 1 year of age, 6% in 1-4 years, 18% in 5-9 years, 46% in 10-19 years, 3% in 20-29 years, and 16% in >30 years of age.
  - Of all cases < 1 year of age, 71% have been hospitalized.

\*The total number of cases for 2012 is provisional and expected to increase as reports currently under investigation are finalized.

### **How is the CDC responding to the increasing cases of Pertussis?**

Preventing infant deaths from pertussis is the primary goal. In order to accomplish this goal, the CDC recommends several strategies:

- Increase Tdap vaccination of pregnant women.
- Maintain high DTaP coverage rates among children and improve coverage with Tdap among adults to prevent the spread of disease and to protect the most vulnerable, particularly young infants. The latest data show that fewer than 10% of adults have received a Tdap booster shot.
- Promote cocooning, which is vaccinating everyone who comes into close contact with an infant.
- Focus efforts most on protecting those at high risk for severe disease (infants, immunocompromised, and pregnant women in 3<sup>rd</sup> trimester) when antibiotics are given to protect people exposed to pertussis (prophylaxis).

CDC and ACIP will continue to evaluate and refine vaccination policy and prevention and control recommendations. The next consideration for ACIP will likely be a recommendation for repeat vaccination with Tdap.

# INFORMATION FOR HEALTH CARE AND PUBLIC HEALTH PROFESSIONALS

## **Case classification**

### **Probable:**

In the absence of a more likely diagnosis, a cough illness lasting  $\geq 2$  weeks, with at least one of the following symptoms:

- paroxysms of coughing;
- inspiratory "whoop"; or
- post-tussive vomiting;

AND

- absence of laboratory confirmation; and
- no epidemiologic linkage to a laboratory-confirmed case of pertussis.

### **Confirmed:**

Acute cough illness of any duration, with isolation of *B. pertussis* from a clinical specimen;

OR

Cough illness lasting  $\geq 2$  weeks, with at least one of the following symptoms:

- paroxysms of coughing;
- inspiratory "whoop"; or
- post-tussive vomiting

AND

polymerase chain reaction (PCR) positive for pertussis;

OR

Illness lasting  $\geq 2$  weeks, with at least one of the following symptoms:

- paroxysms of coughing;
- inspiratory "whoop"; or
- post-tussive vomiting;

AND, contact with a laboratory-confirmed case of pertussis.

### **Comment:**

The clinical case definition above is appropriate for endemic or sporadic cases. In outbreak settings, a case may be defined as a cough illness lasting at least 2 weeks (as reported by a health professional).

## **What are the clinical manifestations?**

- Pertussis is highly communicable and can cause severe disease in very young children.
- It begins with mild upper respiratory tract symptoms and progresses to cough, and can further progress to severe paroxysms, often with a characteristic inspiratory whoop followed by vomiting. Fever is absent or minimal.
- Among older children and adults, the disease usually results in symptoms that can be mistaken for bronchitis and upper respiratory infections - persistent cough, but no whoop. In infants younger than 6 months, apnea is a common manifestation and whoop may be absent.
- It is important to remember that while pertussis is most often considered a young child's disease, it can occur at any age. Pertussis should be considered in older children and adults who have a persistent cough lasting more than 7-14 days that cannot be attributed to another specific illness. Untreated, these older children and adults can act as a reservoir for pertussis disease and infect younger children.

## **What is the incubation period?**

- The incubation period is usually seven to ten days, with a range of 4 to 21 days.

## **What are the modes of transmission?**

- Pertussis is transmitted from person to person via large respiratory droplets generated by coughing or sneezing.
- Pertussis is highly infectious, with attack rates among exposed, nonimmune household contacts as high as 80-90%. The most infectious periods are the catarrhal and early paroxysmal phases.
- Untreated patients remain infectious for 21 days from onset of cough or until 5 days of appropriate antibiotics have been completed.

## **LABORATORY TESTING**

Whenever possible, a nasopharyngeal swab or aspirate should be obtained from all persons with suspected cases. A properly obtained nasopharyngeal swab or aspirate is essential for optimal results. Additional information on specimen collection may be found on CDC's website:

<http://www.cdc.gov/pertussis/clinical/diagnostic-testing/specimen-collection.html>

The following tests are commercially available:

- Culture:  
Isolation of *B. pertussis* by bacterial culture is the standard pertussis diagnostic laboratory test. A positive culture for *B. pertussis* confirms the diagnosis of pertussis. Although bacterial culture is specific for diagnosis, it is relatively

insensitive. Fastidious growth requirements make *B. pertussis* difficult to isolate. Isolation of the organism using direct plating is most successful during the catarrhal stage (i.e., first 1-2 weeks of cough). Success in isolating the organism declines if the patient has received prior antibiotic therapy effective against *B. pertussis*, if specimen collection has been delayed beyond the first 2 weeks of illness, and if the patient has been vaccinated. A nasopharyngeal aspirate or swab should be obtained from the posterior nasopharynx, not the throat, for culture. Specimens should be obtained using polyester, rayon, nylon, or calcium alginate (not cotton) swabs and should be plated directly onto selective culture medium or placed in transport medium. Regan-Lowe agar or freshly prepared Bordet-Gengou medium is generally used for culture: half-strength Regan-Lowe should be used as the transport medium.

- Polymerase Chain Reaction (PCR):

Due to the increased sensitivity and faster reporting of PCR results, many laboratories are now using this method exclusively. PCR should be used in addition to, and not as a replacement for culture. No PCR product has been approved by the FDA, and there are no standardized protocols, reagents, or reporting formats for pertussis PCR testing. Consequently, PCR assays vary widely among laboratories and some results may or may not differentiate between *B. pertussis* and other organisms (for example, *Bordetella holmesii*). Continued use of culture is essential for confirmation of PCR results.

Collection methods for PCR are similar to those for culture, and often the same sample can be used for both tests. However, calcium alginate swabs cannot be used to collect nasopharyngeal specimens for PCR. Like culture, PCR is also affected by specimen collection. An inappropriately obtained nasopharyngeal swab will likely be negative by both culture and PCR. Nasopharyngeal aspirates might be preferred for both culture and PCR because they tend to recover larger numbers of bacteria. For more information, see Best Practices for Health Care Professionals on the use of Polymerase Chain Reaction (PCR) for Diagnosing Pertussis, which is located at the CDC Pertussis Web site:

<http://www.cdc.gov/pertussis/clinical/diagnostic-testing/diagnosis-pcr-bestpractices.html>

- Serology:

Serologic testing may be useful in adults and adolescents who present late in the course of their illness, when both culture and PCR are likely to be negative. The currently available serologic tests measure antibodies that could result from either infection or vaccination, so a positive serologic response simply means that the person has been exposed to pertussis by either recent or remote infection or by recent or remote vaccination. Since vaccination can induce both IgM and IgA antibodies, use of such serologic assays cannot differentiate infection from vaccine response. At this time, serologic test results should not be relied upon for case confirmation of pertussis infection.

## **TREATMENT AND POSTEXPOSURE PROPHYLAXIS**

- A macrolide (erythromycin, clarithromycin and azithromycin) is the preferred antimicrobial for postexposure prophylaxis and treatment of pertussis.
- Antimicrobial treatment administered in the early (catarrhal) phase of the illness can modify the severity of the symptoms. An antimicrobial generally does not modify the severity or the course of the illness after paroxysmal cough is established but is used to eliminate *B. pertussis* and halt transmission. Without use of an effective antimicrobial, *B. pertussis* can be recovered for 6 weeks or longer from infant patients and for 21 days or longer from adult and adolescent patients.
- If a patient is prescribed the 3-day z-pak, exclude for the 5 days but don't prescribe an additional 2 days of treatment. However, the 5-day course (5-day z-pak) should be the norm and be encouraged.
- Detailed prophylaxis and treatment guidelines can be found in the CDC's MMWR entitled Recommended antimicrobial agents for the treatment and postexposure prophylaxis of pertussis: 2005 CDC Guidelines MMWR 2005:54(No.RR-14). <http://www.cdc.gov/mmwr/PDF/rr/rr5414.pdf>
- CDC recommends administration of chemoprophylaxis to all close contacts and all household members of a pertussis case-patient, regardless of age and vaccination status: this might prevent or minimize transmission. A close contact is anyone who had face-to-face contact or shared a confined space for a prolonged period of time with an infected person or had direct contact with respiratory secretions from a symptomatic person.

## **REPORTING**

- Pertussis is an immediately reportable disease as per N.J.A.C. 8:57 which can be accessed at: <http://www.nj.gov/health/cd/reporting.shtml>
- Please report all suspect cases to your local health department. If unable to reach the local health department, notify the NJDOH/Vaccine Preventable Disease Program (during regular business hours) at (609) 826-4860. If after-hours or on the weekend, call NJDOH at (609) 392-2020.

### **Where can I get more information on pertussis?**

- Your healthcare provider
- Your local health department
- New Jersey Department of Health  
Vaccine Preventable Disease Program:  
<http://www.nj.gov/health/cd/vdp/index.shtml>

NJDOH Handwashing Materials  
<http://www.nj.gov/health/cd/handwashing.shtml>

NJDOH Immunization Requirements  
<http://www.nj.gov/health/cd/imm.shtml>

New Jersey Immunization Information System (NJIIS)  
<https://njiis.nj.gov/njiis/>

- Centers for Disease Control and Prevention websites:  
<http://www.cdc.gov/vaccines/vpd-vac/pertussis/default.htm>  
<http://www.cdc.gov/pertussis/>
- Childhood immunization schedule:  
[www.cdc.gov/vaccines/recs/schedules/child-schedule.htm](http://www.cdc.gov/vaccines/recs/schedules/child-schedule.htm)
- Vaccine Information Statements:  
[http://www.immunize.org/vis/vis\\_dtap.asp](http://www.immunize.org/vis/vis_dtap.asp)  
[http://www.immunize.org/vis/vis\\_td-tdap.asp](http://www.immunize.org/vis/vis_td-tdap.asp)
- CDC-INFO Contact Center at:  
English and Spanish  
(800) CDC-INFO  
(800) 232-4636  
TTY: (888) 232-6348

### **CLINICAL RESOURCES:**

- Updated Recommendations for use of Tetanus Toxoid, Reduced Diphtheria Toxoid, and Acellular Pertussis (Tdap) Vaccine in Adults Aged 65 Years and Older—Advisory Committee on Immunization Practices (ACIP), 2012  
<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6125a4.htm>
- Updated Recommendations for Use of Tetanus Toxoid, Reduced Diphtheria Toxoid and Acellular Pertussis Vaccine (Tdap) in Pregnant Women and Persons Who Have or Anticipate Having Close Contact with an Infant Ages < 12 Months - Advisory Committee of Immunization Practices (ACIP), 2011  
<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6041a4.htm>
- Updated Recommendations for Use of Tetanus Toxoid, Reduced Diphtheria Toxoid and Acellular Pertussis (Tdap) Vaccine from the Advisory Committee of Immunization Practices, 2010  
<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6001a4.htm>
- Recommended Antimicrobial Agents for Treatment and Postexposure Prophylaxis of Pertussis which can be accessed at: <http://www.cdc.gov/mmwr/PDF/rr/rr5414.pdf>

**This information is intended for educational purposes only and is not intended to replace consultation with a health care professional.**